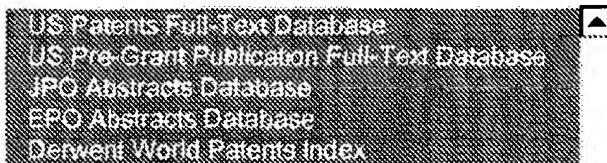


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Terms	Documents
L3 and luciferase	12

**Database:** IBM Technical Disclosure Bulletins**Search:**  
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<u>Set Name</u> side by side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> result set
<i>DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ</i>			
<u>L4</u>	L3 and luciferase	12	<u>L4</u>
<u>L3</u>	lux with positive	151	<u>L3</u>
<u>L2</u>	L1 and positive	402	<u>L2</u>
<u>L1</u>	lux and luciferase	497	<u>L1</u>

END OF SEARCH HISTORY

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
15 March 2001 (15.03.2001)

PCT

(10) International Publication Number  
**WO 01/18195 A2**

- (51) International Patent Classification<sup>2</sup>: C12N 15/00 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (21) International Application Number: PCT/US00/24699
- (22) International Filing Date:  
7 September 2000 (07.09.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/152,904 8 September 1999 (08.09.1999) US
- (71) Applicant: XENOCORPORATION [US/US]; 860 Atlantic Avenue, Alameda, CA 94501 (US).
- (72) Inventors: FRANCIS, Kevin, P.; 3521 Oleander, Alameda, CA 94502 (US). CONTAG, Pamela, R.; 6110 Bollinger Road, San Jose, CA 95129 (US). JOH, Danny, J.; Apartment K108, 2000 Walnut Avenue, Fremont, CA 94538 (US).
- (74) Agents: SHOLTZ, Charles, K.; Xenogen Corporation, 860 Atlantic Avenue, Alameda, CA 94501 et al. (US).

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— Without international search report and to be republished upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**WO 01/18195 A2**

(54) Title: LUCIFERASE EXPRESSION CASSETTES AND METHODS OF USE

(57) Abstract: The present invention relates to bacterial luciferase expression cassettes suitable for conferring bioluminescence properties on Gram-positive bacteria, cells transformed with such cassettes, and methods of making and using such cassettes.

**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 10 of 12 returned.****[1] 1. Document ID: US 20030119732 A1**

L4: Entry 1 of 12

File: PGPB

Jun 26, 2003

PGPUB-DOCUMENT-NUMBER: 20030119732

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030119732 A1

TITLE: CDDO-compounds and combination therapies thereof

PUBLICATION-DATE: June 26, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Konopleva, Marina	Houston	TX	US	
Andreeff, Michael	Houston	TX	US	
Sporn, Michael B.	Tunbridge	VT	US	

US-CL-CURRENT: 514/12
[Full](#) | [Title](#) | [Claims](#) | [Front](#) | [Sequence](#) | [Classification](#) | [Date](#) | [Software](#) | [Sequence](#) | [Attachment](#) | [SAC](#) | [Originator](#) | [Revised](#)
**[2] 2. Document ID: US 20030044802 A1**

L4: Entry 2 of 12

File: PGPB

Mar 6, 2003

PGPUB-DOCUMENT-NUMBER: 20030044802

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030044802 A1

TITLE: Cellular transcriptional logic devices

PUBLICATION-DATE: March 6, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sayler, Gary S.	Blaine	TN	US	
Fleming, James T.	Knoxville	TN	US	
Applegate, Bruce	West Lafayette	TN	US	
Simpson, Michael L.	Knoxville	TN	US	

US-CL-CURRENT: 435/6; 435/287.2, 702/20
[Full](#) | [Title](#) | [Claims](#) | [Front](#) | [Sequence](#) | [Classification](#) | [Date](#) | [Software](#) | [Sequence](#) | [Attachment](#) | [SAC](#) | [Originator](#) | [Revised](#)
**[3] 3. Document ID: US 20030027241 A1**

L4: Entry 3 of 12

File: PGPB

Feb 6, 2003

PGPUB-DOCUMENT-NUMBER: 20030027241  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030027241 A1

TITLE: BIOLUMINESCENT BIOSENSOR DEVICE

PUBLICATION-DATE: February 6, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sayler, Gary S.	Blaine	TN	US	
Ripp, Steven A.	Knoxville	TN	US	
Applegate, Bruce M.	West Lafayette	IN	US	

US-CL-CURRENT: 435/29; 356/246, 422/50, 422/55, 422/58, 435/235.1, 435/320.1,  
435/34, 435/832, 435/842, 435/848, 435/863, 435/873, 435/879, 435/882, 435/885,  
435/909, 436/535, 536/23.7

[Full](#) | [Title](#) | [Abstract](#) | [Filing Date](#) | [Classification](#) | [Date](#) | [Sequence](#) | [References](#) | [Attachments](#) | [Print](#) | [Download](#) | [Email](#)

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**4. Document ID: US 20020192755 A1**

L4: Entry 4 of 12

File: PGPB

Dec 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020192755  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020192755 A1

TITLE: Methods of screening for introduction of DNA into a target cell

PUBLICATION-DATE: December 19, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Francis, Kevin P.	Alameda	CA	US	
Doyle, Timothy C.	Alameda	CA	US	
Nawotka, Kevin A.	Alameda	CA	US	

US-CL-CURRENT: 435/69.1; 435/252.3, 435/476

[Full](#) | [Title](#) | [Abstract](#) | [Filing Date](#) | [Classification](#) | [Date](#) | [Sequence](#) | [References](#) | [Attachments](#) | [Print](#) | [Download](#) | [Email](#)

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**5. Document ID: US 20020137215 A1**

L4: Entry 5 of 12

File: PGPB

Sep 26, 2002

PGPUB-DOCUMENT-NUMBER: 20020137215  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020137215 A1

TITLE: Compositions and methods for use thereof in modifying the genomes of microorganisms

PUBLICATION-DATE: September 26, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Francis, Kevin P.	Alameda	CA	US	
Purchio, Anthony F.	Alameda	CA	US	

US-CL-CURRENT: 435/473; 435/320.1
 Full  Title  Claims  Front  Back  Classification-Date  Reference  Sequence  Attachment  Page  Grade-Dates  Images

## 6. Document ID: US 20020025514 A1

L4: Entry 6 of 12

File: PGPB

Feb 28, 2002

PGPUB-DOCUMENT-NUMBER: 20020025514  
 PGPUB-FILING-TYPE: new  
 DOCUMENT-IDENTIFIER: US 20020025514 A1

TITLE: High throughput assay

PUBLICATION-DATE: February 28, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Jaworski, Deborah D.	Collegeville	PA	US	
Murray, Monique F.	King of Prussia	PA	US	

US-CL-CURRENT: 435/5; 435/345, 435/7.2, 435/7.22
 Full  Title  Claims  Front  Back  Classification-Date  Reference  Sequence  Attachment  Page  Grade-Dates  Images

## 7. Document ID: US 6544729 B2

L4: Entry 7 of 12

File: USPT

Apr 8, 2003

US-PAT-NO: 6544729  
 DOCUMENT-IDENTIFIER: US 6544729 B2

TITLE: Bioluminescent biosensor device

 Full  Title  Claims  Front  Back  Classification-Date  Reference  Sequence  Attachment  Page  Grade-Dates  Images

## 8. Document ID: US 6117643 A

L4: Entry 8 of 12

File: USPT

Sep 12, 2000

US-PAT-NO: 6117643  
 DOCUMENT-IDENTIFIER: US 6117643 A  
 \*\* See image for Certificate of Correction \*\*

TITLE: Bioluminescent bioreporter integrated circuit

 Full  Title  Claims  Front  Back  Classification-Date  Reference  Sequence  Attachment  Page  Grade-Dates  Images

## 9. Document ID: US 5538892 A

L4: Entry 9 of 12

File: USPT

Jul 23, 1996

US-PAT-NO: 5538892

DOCUMENT-IDENTIFIER: US 5538892 A

TITLE: Nucleic acids encoding a TGF-.beta. type 1 receptor

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## 10. Document ID: US 5221623 A

L4: Entry 10 of 12

File: USPT

Jun 22, 1993

US-PAT-NO: 5221623

DOCUMENT-IDENTIFIER: US 5221623 A

TITLE: Use of bacterial luciferase structural genes for cloning and monitoring gene expression in microorganisms and for tagging and identification of genetically engineered organisms[Find](#) [Edit](#) [Delete](#) [Format](#) [E-mail](#) [Print](#) [Image](#)[Find](#) [Edit](#) [Delete](#) [Format](#) [E-mail](#) [Print](#) [Image](#)[Generate Collection](#)[Print](#)

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L3 and luciferase	12

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L4: Entry 11 of 12

File: USPT

Mar 23, 1993

US-PAT-NO: 5196318

DOCUMENT-IDENTIFIER: US 5196318 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Precisely regulated expression of deleterious genes

[Full](#) | [List](#) | [Detail](#) | [Front](#) | [Previous](#) | [Document](#) | [Date](#) | [Referenced](#) | [Sequence](#) | [Attachment](#) | [Sort](#) | [Change Order](#) | [Format](#)**12. Document ID: JP 2003509029 W WO 200118195 A2 AU 200071266 A EP 1212429 A2**

L4: Entry 12 of 12

File: DWPI

Mar 11, 2003

DERWENT-ACC-NO: 2001-226744

DERWENT-WEEK: 200319

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TITLE: Luciferase expression cassettes for conferring bioluminescence on gram-positive bacteria, has polynucleotide encoding luciferase gene products and gram-positive Shine-Dalgarno sequences upstream of polynucleotide[Full](#) | [List](#) | [Detail](#) | [Front](#) | [Recent](#) | [Document](#) | [Date](#) | [Referenced](#) | [Sequence](#) | [Attachment](#) | [Sort](#) | [Change Order](#) | [Format](#)[Generate Collection](#)[Print](#)

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=> s lux (10a) positive  
L1 117 LUX (10A) POSITIVE

=> s l1 and luciferase  
L2 36 L1 AND LUCIFERASE

=> dup rem  
ENTER L# LIST OR (END):12  
PROCESSING COMPLETED FOR L2  
L3 12 DUP REM L2 (24 DUPLICATES REMOVED)

=> d 1-12

L3 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2003 ACS on STN  
AN 2002:90237 HCAPLUS  
DN 136:129939

TI Transposable **luciferase** expression cassettes for Gram positive  
bacteria and their use to monitor bacterial infections by in situ  
bioluminescence

IN Francis, Kevin P.; Purchio, Anthony F.

PA Xenogen Corporation, USA

SO PCT Int. Appl., 114 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 2002008431	A1	20020131	WO 2001-US7324	20010307	
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 2002137215	A1	20020926	US 2001-888049	20010621	

PRAI US 2000-216257P P 20000706  
US 2001-274105P P 20010307  
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 1  
AN 2001:185908 HCAPLUS  
DN 134-232671  
TI *Luciferase expression cassettes for Gram-positive bacteria and their use in monitoring bacterial infection using in situ bioluminescence*  
IN Francis, Kevin P.; Contag, Pamela R.; Joh, Danny J.  
PA Xenogen Corporation, USA  
SO PCT Int. Appl., 73 pp.  
CODEN: PIXXD2

DT Patent  
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001018195	A2	20010315	WO 2000-US24699	20000907
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	EP 1212429	A2	20020612	EP 2000-960044	20000907
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL			
	JP 2003509029	T2	20030311	JP 2001-522406	20000907
PRAI	US 1999-152904P	P	19990908		
	WO 2000-US24699	W	20000907		

L3 ANSWER 3 OF 12 MEDLINE on STN DUPLICATE 2  
AN 2001086882 MEDLINE  
DN 20566707 PubMed ID: 11114940  
TI Amino acid residues in LuxR critical for its mechanism of transcriptional activation during quorum sensing in *Vibrio fischeri*.  
AU Trott A E; Stevens A M  
CS Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, USA.  
SO JOURNAL OF BACTERIOLOGY, (2001 Jan) 183 (1) 387-92.  
Journal code: 2985120R. ISSN: 0021-9193.  
CY United States  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200101  
ED Entered STN: 20010322  
Last Updated on STN: 20010322  
Entered Medline: 20010118

L3 ANSWER 4 OF 12 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN  
AN 2000:397363 SCISEARCH  
GA The Genuine Article (R) Number: 316LF  
TI Monitoring bioluminescent *Staphylococcus aureus* infections in living mice using a novel luxABCDE construct  
AU Francis K P; Joh D; BellingerKawahara C; Hawkinson M J; Purchio T F; Contag P R (Reprint)  
CS XENOGEN CORP, 860 ATLANTIC AVE, ALAMEDA, CA 94501 (Reprint); XENOGEN CORP, ALAMEDA, CA 94501; STANFORD UNIV, MED CTR, DEPT PEDIAT, DIV NEONATOL & DEV MED, STANFORD, CA 94305  
CYA USA  
SO INFECTION AND IMMUNITY, (JUN 2000) Vol. 68, No. 6, pp. 3594-3600.  
Publisher: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904.

ISSN: 0019-9567.

DT Article; Journal

FS LIFE

LA English

REC Reference Count: 19

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L3 ANSWER 5 OF 12 MEDLINE on STN DUPLICATE 3

AN 97394920 MEDLINE

DN 97394920 PubMed ID: 9251182

TI Evaluation of **luciferase** reporter bacteriophage A511::luxAB for detection of Listeria monocytogenes in contaminated foods.

AU Loessner M J; Rudolf M; Scherer S

CS Institut fur Mikrobiologie, Technische Universitat Munchen, Freising-Weihenstephan, Germany.. M.J.Loessner@lrz.tu-muenchen.de

SO APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (1997 Aug) 63 (8) 2961-5. Journal code: 7605801. ISSN: 0099-2240.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 199709

ED Entered STN: 19970926

Last Updated on STN: 19970926

Entered Medline: 19970918

L3 ANSWER 6 OF 12 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN

AN 95:135650 SCISEARCH

GA The Genuine Article (R) Number: QG250

TI DETECTION AND QUANTIFICATION OF VIBRIO-FISCHERI AUTOINDUCER FROM SYMBIOTIC SQUID LIGHT ORGANS

AU BOETTCHER K J; RUBY E G (Reprint)

CS UNIV SO CALIF, DEPT BIOL SCI, LOS ANGELES, CA, 90089 (Reprint); UNIV SO CALIF, DEPT BIOL SCI, LOS ANGELES, CA, 90089

CYA USA

SO JOURNAL OF BACTERIOLOGY, (FEB 1995) Vol. 177, No. 4, pp. 1053-1058.

ISSN: 0021-9193.

DT Article; Journal

FS LIFE

LA ENGLISH

REC Reference Count: 46

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L3 ANSWER 7 OF 12 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN DUPLICATE 4

AN 96:45936 SCISEARCH

GA The Genuine Article (R) Number: TM498

TI HIGHLY BIOLUMINESCENT STREPTOCOCCUS-THERMOPHILUS STRAIN FOR THE DETECTION OF DAIRY-RELEVANT ANTIBIOTICS IN MILK

AU JACOBS M F (Reprint); TYNKKYNNEN S; SIBAKOV M

CS NIDR, MICROBIAL ECOL LAB, BLDG 30, ROOM 313, BETHESDA, MD, 20892 (Reprint); UNIV MARYLAND, DEPT MICROBIOL, COLLEGE PK, MD, 20742; VALIO RES & DEV CTR, SF-00370 HELSINKI, FINLAND

CYA USA; FINLAND

SO APPLIED MICROBIOLOGY AND BIOTECHNOLOGY, (DEC 1995) Vol. 44, No. 3-4, pp.

405-412.

ISSN: 0175-7598.

DT Article; Journal

FS LIFE; AGRI

LA ENGLISH

REC Reference Count: 35

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L3 ANSWER 8 OF 12 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN DUPLICATE 5

AN 94:626245 SCISEARCH

GA The Genuine Article (R) Number: PJ125

TI BIOLUMINESCENCE OF MYCTOPHID AND STOMIIFORM FISHES IS NOT DUE TO BACTERIAL **LUCIFERASE**

AU HAYGOOD M G (Reprint); EDWARDS D B; MOWLD G; ROSENBLATT R H

CS UNIV CALIF SAN DIEGO, SCRIPPS INST OCEANOOG, DIV MARINE BIOL RES, LA JOLLA, CA, 92093 (Reprint); UNIV CALIF SAN DIEGO, SCRIPPS INST OCEANOOG, CTR MARINE BIOMED & BIOTECHNOL, LA JOLLA, CA, 92093

CY A USA

SO JOURNAL OF EXPERIMENTAL ZOOLOGY, (01 OCT 1994) Vol. 270, No. 2, pp. 225-231.

DT ISSN: 0022-104X.

FS Note; Journal

LA LIFE; AGRI

LA ENGLISH

REC Reference Count: 23

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L3 ANSWER 9 OF 12 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT/ISI on STN

AN 1993-02490 BIOTECHDS

TI The application of lux genes;  
bacterium **luciferase** lux gene for use as a reporter gene; a review

AU Hill P J; Rees C E D; Winson M K; \*Stewart G S A B

LO University of Nottingham, Faculty of Agricultural and Food Sciences, Department of Applied Biochemistry and Food Science, Sutton Bonington Campus, Loughborough, Leicestershire, LE12 5RD, UK.

SO Biotechnol.Appl.Biochem.; (1993) 17, 1, 3-14

CODEN: BABIEC

DT Journal

LA English

L3 ANSWER 10 OF 12 HCPLUS COPYRIGHT 2003 ACS on STN

AN 1993:19014 HCPLUS

DN 118:19014

TI Formation of the LuxR protein in the *Vibrio fischeri* lux system is controlled by HtpR through the GroESL proteins

AU Adar, Y. Y.; Simaan, M.; Ulitzur, S.

CS Dep. Food. Eng. Biotechnol., Technion-Israel Inst. Technol., Haifa, 32000, Israel

SO Journal of Bacteriology (1992), 174(22), 7138-43

CODEN: JOBAAY; ISSN: 0021-9193

DT Journal

LA English

L3 ANSWER 11 OF 12 MEDLINE on STN DUPLICATE 6

AN 90299789 MEDLINE

DN 90299789 PubMed ID: 2163384

TI Depressed light emission by symbiotic *Vibrio fischeri* of the sepiolid squid *Euprymna scolopes*.

AU Boettcher K J; Ruby E G

CS Department of Biological Sciences, University of Southern California, Los Angeles 90089-0371.

SO JOURNAL OF BACTERIOLOGY, (1990 Jul) 172 (7) 3701-6.

Journal code: 2985120R. ISSN: 0021-9193.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 199008

ED Entered STN: 19900907  
Last Updated on STN: 19900907  
Entered Medline: 19900807

L3 ANSWER 12 OF 12 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN

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TI IDENTIFICATION OF THE OPERATOR OF THE LUX REGULON FROM THE VIBRIO-FISCHERI STRAIN ATCC-7744.

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L3 ANSWER 4 OF 12 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN

AB Strains of *Staphylococcus aureus* were transformed with plasmid DNA containing a *Photobacterium luminescens lux* operon (*luxABCDE*) that was genetically modified to be functional in both gram-**positive** and gram-negative bacteria. *S. aureus* cells containing this novel **lux** construct, downstream of an appropriate promoter sequence, are highly bioluminescent, allowing the detection of fewer than 100 CFU in vitro (direct detection of exponentially dividing cells in liquid culture). Furthermore, these bacteria produce light stably at 37 degrees C and do not require exogenous aldehyde substrate, thus allowing *S. aureus* infections in living animals to be monitored by bioluminescence. Two strains of *S. aureus* 8325-4 that produce high levels of constitutive bioluminescence were injected into the thigh muscles of mice, and the animals were then either treated with the antibiotic amoxicillin or left untreated. Bioluminescence from bacteria present in the thighs of the mice was monitored in vivo over a period of 24 h. The effectiveness of the antibiotic in the treated animals could be measured by a decrease in the light signal. At 8 h, the infection in both groups of treated animals had begun to clear, as judged by a decrease in bioluminescence, and by 24 h no light signal could be detected. In contrast, both groups of untreated mice had strong bioluminescent signals at 24 h. Quantification of CFU from bacteria extracted from the thigh muscles of the mice correlated well with the bioluminescence data. This paper shows for the first time that bioluminescence offers a method for monitoring *S. aureus* infections in vivo that is sensitive and noninvasive and requires fewer animals than conventional methodologies.

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AB The use of bacterial *lux* genes encoding the bioluminescent (*Lux+*) phenotype have been used as reporters of gene expression.

Naturally-occurring bioluminescent bacteria include *Vibrio fischeri*,

*Vibrio harveyi*, *Photobacterium leiognathi*, *Photobacterium phosphoreum*,

*Photobacterium mandapamensis*, *Kryptophanaron alfredi*, *Xanthomonas*

*luminescens* and *Vibrio albensis*. The **Lux+** phenotype has been

established in non-bioluminescent Gram-**positive** and

Gram-negative bacteria by introducing the *lux* operon (or the

**luciferase** (EC-1.14.14.3) *luxA* and *luxB* genes alone) into the

bacterium using a plasmid or transposon vector. Short-chain aldehydes,

e.g. nonanal, can be used to elicit a bioluminescent response from *lux+*

recombinant bacteria. The *lux* genes have been cloned by the polymerase

chain reaction (PCR), and the high interspecies conservation of *lux*

sequences has allowed the synthesis of universal PCR primers. The most

thermotolerant **luciferase**, from *X. luminescens*, is stable in

*Escherichia coli* at up to 42 deg. Luminometers or scintillation counters

can be used to detect emitted light. (52 ref)

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AB *Escherichia coli* that carry a recombinant plasmid bearing the *Vibrio fischeri lux* regulon express luminescence that mimics the luminescence of *V. fischeri*. The *lux* regulon consists of two divergently transcribed operons, the rightward operon (*luxICDABE* genes) and the leftward operon (*luxR* gene). The *luxR* and *luxI* genes and the control region separating the two operons supply the primary regulatory control over the *lux* regulon; the regulatory mechanisms result in a dramatic increase in the rate of **luciferase** synthesis after induction, apparently due to a unique autoregulatory positive feedback mechanism, and in an enormous

difference (> 104) in levels of luminescence in cells before and after induction. The generally accepted model of primary regulation of bioluminescence in *V. fischeri* involves the interaction of the product of the luxR gene and N-(3-oxohexanoyl)homoserine lactone, the autoinducer produced by the enzyme encoded by luxI, the first gene of the rightward operon, with an operator sequence within the control region to stimulate transcription of the rightward operon in a positive feedback loop. We have used deletion mapping of a transcription reporter vector to determine the approximate location of the operator. By site-directed mutagenesis of the presumed operator, we have demonstrated that the 20-base-pair inverted repeat ACCTGTAGGA|TCGTACAGGT (where the vertical line is the center of symmetry), which bears striking similarity to the recognition sequence for the pleiotropic repressor protein LexA, is the operator of the lux regulon. We also found that deletion of sequences upstream of the palindrome leads to increased transcription from the rightward promoter (PR), indicative of a cis-acting element that represses transcription in the absence of the LuxR-autoinducer complex. Modifications of the palindrome that eliminate stimulation LuxR-autoinducer of transcription from PR have no effect on repression by the cis-acting mechanism(s), suggesting that the palindrome is not necessary for repression of the rightward operon. Thus, it appears that the large increase in transcription upon induction of the lux regulon is the result of at least two independent mechanisms, one positive and the other negative.

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L1            117 S LUX (10A) POSITIVE  
L2            36 S L1 AND LUCIFERASE  
L3            12 DUP REM L2 (24 DUPLICATES REMOVED)

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